REMARKS

Claims 22-42, all the claims pending in the application, stand rejected on prior art grounds. Applicants respectfully traverse the rejections based on the following discussion.

I. The Prior Art Rejections

Claims 22-42 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Salonidis, et al. (U.S. Patent No. 6,865,371 B2), hereinafter referred to as "Salonidis" in view of Johansson, et al. (U.S. Publication No. 2002/0044549 A1), hereinafter referred to as "Johansson", and in further view of Chatterjee, et al. ("An On-Demand Weighted Clustering Algorithm (WCA) for Ad hoc Networks," IEEE Xplore Release 2.1, Global Telecommunications Conference, 2000, Globecom'00, pp. 1697-1701), hereinafter referred to as "Chatterjee". Applicants respectfully traverse these rejections based on the following discussion.

Salonidis teaches a method for connecting two or more devices via a wireless communication channel is provided. In one embodiment, a method of connecting a first device to a second device includes the steps of arbitrarily assigning one of two possible states to each device, wherein in a first state, a device seeks to establish a connection with another device, and in a second state, the device renders itself available for connection with the other device; and alternating a present state of each device between the first state and the second state in accordance with a predefined probability distribution until either a predetermined timeout period has expired or a connection between the devices has been established, the length of time that each device remains in the first and second states being controlled by the probability distribution. In a second embodiment, a method of forming a scatternet between a plurality of devices or

nodes in an ad hoc wireless communication network is provided.

Johansson teaches two logically separated scatternets, the maximum connectivity scatternet (MCS) and the traffic scatternet (TS). An MCS maintains information about all nodes in the scatternet in order to facilitate a quick path establishment when a destination node is searched for. The MCS is maintained autonomously as new nodes arrive to the scatternet and other nodes leave the scatternet. A TS is established on a per session basis, primarily between two nodes in the scatternet. The TS is designed to achieve the best possible performance for the data flow between the involved nodes. When supported, in addition to establishing dedicated TS piconets and/or dedicated TS links, this may involve switching to the Bluetooth high speed mode on TS links. An overall scatternet may consist of one MCS and several TSs.

Chatterjee teaches a multi-cluster, multi-hop packet radio network architecture for wireless systems which can dynamically adapt itself with the changing network configurations. Due to the dynamic nature of the mobile nodes, their association and dissociation to and from clusters perturb the stability of the system, and hence a reconfiguration of the system is unavoidable. At the same time it is vital to keep the topology stable as long as possible. The clusterheads, which form a dominant set in the network, decide the topology and are responsible for its stability. Chatterjee provides a weighted clustering algorithm (WCA) which takes into consideration the ideal degree, transmission power, mobility and battery power of a mobile node. The number of nodes in a cluster is kept around a pre-defined threshold to facilitate the optimal operation of the medium access control (MAC) protocol.

However, the claimed invention contains features, which are patentably distinguishable from the prior art references of record. Page 2 of the Office Action states that the coordinator

node in Salonidis has a view of the nodes in the network being similar to a star network. However, there is nothing in Salonidis (either in col. 12, lines 10-50 or col. 4, liens 1-23 or elsewhere) that reaches this conclusion, rather this is merely postulation in the Office Action without substantive proof. In fact, page 3 of the Office Action admits that neither Salonidis or Johansson teaches "modeling all nodes in said wireless network in a star-shaped graphical format," but instead, page 4 of the Office Action states that Chatterjee discloses modeling all nodes in a wireless network in a star-shaped graphical format (citing page 1698, section 2 of Chatterjee). However, Chatterjee teaches no such concept. Rather, page 1698, section 2 of Chatterjee merely states:

> In the assumed graph model of the network, the mobile terminals are represented as nodes and there exists an edge between two nodes if they can communicate with each other directly (i.e., one node lies within the transmission range of another). The performance of these heuristics were shown in [S. Basagni, "Distributed Clustering for Ad Hoc Networks," International Symposium on Parallel Architectures, Algorithms and Networks', Perth, June 1999, pp. 310-315; and M. Gerla and J. T.C. Tsai, "Multicluster, Mobile, Multimedia Radio Network," Wireless Networks, 1(3) 1995, pp.255-265] by simulation experiments where mobile nodes were randomly placed in a square grid and moved with different speeds in different directions.

There is nothing in the above-quoted language, or any other portion of Chatterjee, that indicates modeling all nodes in a wireless network in a star-shaped graphical format as claimed by the Applicants. In fact, the above language suggests an opposite teaching: randomly placed nodes. A star-shaped graphical format is a clearly defined and recognizable shape. Conversely, a random format cannot be clearly defined and is generally not representative of any particular shape, let alone a star-shaped format. Therefore, Chatterjee is missing one of the elements of the

Applicants' claimed invention, and even a combination of Chatterjee with Salonidis and Johansson fails to teach all of the elements of the Applicants' claimed invention.

Pages 3 and 4 of the Office Action further admit that neither Salonidis or Johansson teaches "assigning a weight to said all nodes, wherein said weight is a function of defined optimization parameters comprising an amount of neighbor nodes of each said node, a power consumption of said node, and a maintenance overhead associated with said node; updating said weight of said all nodes at each occurrence of a removal of an edge of each node marked as any of said maser node and said slave node."

Page 4 of the Office Action then states that page 1701, section V of Chatterjee teaches "updating said weight of said all nodes at teach occurrence of a removal of an edge of each node marked as any of said master node and said slave node." However, page 1701, section V of Chatterjee merely states:

> We propose an on-demand weighted clustering algorithm (WCA) which can dynamically adapted itself with the ever changing topology of ad hoc networks. The WCA has the flexibility of assigning different weights and takes into an account a combined effect of the ideal degree, transmission power, mobility and battery power of the nodes. The algorithm is executed only when there is a need, i.e., when a node is no longer able to attach itself to any of the existing clusterheads. Our algorithm performs significantly better than both of the Highest-Degree and the Lowest-ID heuristics. In particular, the number of reaffiliations for our algorithm is about 50% of the number obtained from Lowest-ID heuristic. Though our approach yields marginally better results than the Node-Weight heuristic, it considers more realistic system parameters and provides the flexibility of adjusting the weighing factors.

There is nothing in the above-quoted language of Chatterjee (or anywhere else in Chatterjee) that remotely teaches (either directly or by equivalence) "updating said weight of

said all nodes at teach occurrence of a removal of an edge of each node marked as any of said master node and said slave node" as provided by the Applicants' claimed invention. Therefore, Chatterjee is missing one of the elements of the Applicants' claimed invention, and even a combination of Chatterjee with Salonidis and Johansson fails to teach all of the elements of the Applicants' claimed invention.

Next, page 5 of the Office Action states that neither Johansson, Salonidis, or Chatterjee, alone or in combination with one another, teaches that the formation of clusters and interconnection between the [subgroups] is based on weight associated with each node in the network where the weight of a node depends upon the number of nodes in its neighborhood. However, the Office Action rejects claims 25 and 33 because the Office Action feels such limitations are obvious from a reading of the prior art. It appears that such a rejection is based on Official Notice, and as such, the Applicants respectfully make a demand for evidence that either (1) the prior art of record teaches these features, or (2) another reference teaches these features. Absent such tangible evidence the rejection is improper.

Because Salonidis presents a method of connecting mobile devices to form an ad-hoc network (such as a scatternet), this inherently requires assigning master roles and slave roles to devices within the network, for the network to function correctly. A master has to perform certain overhead (coordination) responsibilities, which is a cost for the device. Therefore, there is a limit to how many slaves a master (an individual device) can serve. From an ad-hoc network's perspective, too many masters in the network are inefficient, because this slows things down, and many nodes are unnecessarily incurring overheads. However, the goal of the embodiments herein is to minimize the number of masters in the network. This is an

optimization problem, which is quite different from the formation problem addressed by Salonidis and requires different techniques and technologies than the formation of the ad-hoc network. The fact that one can create an ad-hoc network tells us nothing about how to optimize (minimize) the number of masters for the network. Conversely, the embodiments herein minimize the number of masters in an ad-hoc network so that the overheads for an ad-hoc network to function properly are minimized.

Furthermore, as stipulated in Graham v. John Deere Co., 383 U.S. 1, 86 S.Ct. 684, 15 L.Ed.2d 545, U.S.P.Q. 459 (1966), which provides the correct factual inquiries which establish a background for determining obviousness under 35 U.S.C. §103(a), one of these factual inquiries which determine obviousness is determining what the level is of one of ordinary skill in the art. Here, the level of one of ordinary skill in the art is that of an engineer who works in network architecture design and development. Accordingly, such an individual would not find the claimed invention obvious in light of the combination of Johansson, Salonidis, and Chatterjee given the requirement of having to separate individually complete technologies in order to try and piece together a new device/method as provided in the application, thereby indicating that the claimed invention is unobvious in light of the collective prior art.

Insofar as references may be combined to teach a particular invention, and the proposed combination of Johansson, Salonidis, and Chatterjee case law establishes that, before any prior-art references may be validly combined for use in a prior-art 35 U.S.C. § 103(a) rejection, the individual references themselves or corresponding prior art must suggest that they be combined. The Office Action fails to indicate where in either Johansson or Salonidis or Chatterjee or in any other prior art it is taught or suggested that such a motivation to combine (as suggested by the

Office Action) exists and how such a combination could logically occur. Absent such a showing, the rejection is improper. Rather, the Office Action simply states that the references are in the same field of endeavor without providing tangible evidence demonstrating this.

For example, in In re Sernaker, 217 USPQ 1, 6 (C.A.F.C. 1983), the court stated: "[P]rior art references in combination do not make an invention obvious unless something in the prior art references would suggest the advantage to be derived from combining their teachings." Furthermore, the court in Uniroyal, Inc. v. Rudkin-Wiley Corp., 5 USPQ 2d 1434 (C.A.F.C. 1988), stated, "[w]here prior-art references require selective combination by the court to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself. . . . Something in the prior art must suggest the desirability and thus the obviousness of making the combination."

In the present application, the reason given to support the proposed combination is improper, and is not sufficient to selectively and gratuitously substitute parts of one reference for a part of another reference in order to try to meet, but failing nonetheless, the Applicants' novel claimed invention. Furthermore, the claimed invention meets the above-cited tests for obviousness by including embodiments such as modeling all nodes in a wireless network in a star-shaped graphical format, assigning master or slave status to each node and connecting slave nodes to master nodes to form subgroups based on defined optimization parameters comprising an amount of neighbor nodes of each said node, a power consumption of said node, and maintenance overhead associated with the node and minimizing the number of master nodes in the wireless network. As such, all of the claims of this application are, therefore, clearly in condition for allowance, and it is respectfully requested that the Examiner pass these claims to

allowance and issue.

As declared by the Federal Circuit:

> In proceedings before the U.S. Patent and Trademark Office, the Examiner bears the burden of establishing a prima facie case of obviousness based upon the prior art. The Examiner can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. In re Fritch, 23 USPQ 2d 1780, 1783 (Fed. Cir. 1992) citing In re Fine, 5 USPQ 2d 1596, 1598 (Fed. Cir. 1988).

Here, the Examiner has not met the burden of establishing a prima facie case of obviousness. It is clear that, not only does Salonidis and Johansson fail to disclose all of the elements (as admitted in the Office Action) of the claims of the present invention, but also, if combined with Chatterjee fails to disclose these elements as well. The unique elements of the claimed invention are clearly an advance over the prior art.

The Federal Circuit also went on to state:

> The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. . . . Here the Examiner relied upon hindsight to arrive at the determination of obviousness. It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. Fritch at 1784-85, citing In re Gordon, 221 USPQ 1125, 1127 (Fed. Cir. 1984).

Here, there is no suggestion that Salonidis, alone or in combination with Johansson and Chatterjee teaches a method and computer program product containing all of the limitations of the claimed invention. Consequently, there is absent the "suggestion" or "objective teaching" that would have to be made before there could be established the legally requisite "prima facie

case of obviousness."

In view of the foregoing, the Applicants respectfully submit that it would be illogical and unreasonable to assume one of ordinary skill in the art would be motivated to combine all of the cited prior art references, and in particular, Salonidis and Johansson and Chatterjee together to teach the features defined by independent claims 22, 30, and 38 and as such, claims 22, 30, and 38 are patentable over Salonidis, alone or in combination with Johansson and Chatterjee. Furthermore, dependent claims 23-29, 31-37, and 39-42 are similarly patentable over Salonidis, alone or in combination with Johansson and Chatterjee, not only by virtue of their dependency from patentable independent claims, respectively, but also by virtue of the additional features of the invention they define. Thus, the Applicants respectfully request that these rejections be reconsidered and withdrawn.

Moreover, the Applicants note that all claims are properly supported in the specification and accompanying drawings, and no new matter is being added. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections.

II. Formal Matters and Conclusion

In view of the foregoing, Applicants submit that claims 22-42, all the claims presently pending in the application, are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to

discuss any other changes deemed necessary. Please charge any deficiencies and credit any overpayments to Attorney's Deposit Account Number 09-0441.

Respectfully submitted,

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